J. Martin
Consultant Design

Consultant Design				
Action	Info	Routing	Attach	Initial
		Date 11/3/05		
	✓	Bureau Chief		
		Consultant plans Eng		
		Design Supervisor		
		CTEP Engineer		
	✓	ALL ENGINEERING STAFF		
	✓	ALL DESIGN CONSULTANTS		
	✓	File		

Montana Department of Transportation
PO Box 201001
Helena, MT 59620-1001

Memorandum

To: Distribution

From: Paul Ferry, P. E.
Highways Engineer

Date: November 2, 2005

Subject: Milling Tapers

For overlay projects we typically provide a detail in plans of a milled taper for the connection at project ends and other hard interfaces such as bridge ends. The length of these connection transitions to date has been specified at 100' (30 m).

Field construction personnel have encountered problems providing a smooth transition when the 100' (30 m) taper is utilized. In an effort to correct these problems they have tried extending the taper and determined that a 200' (60 m) transition length will resolve these issues. Increasing the minimum taper length to 200' greatly enhances the field crews' ability to construct a smooth connection. Providing this additional length also helps address the situations where an overlay is placed on a project that has existing tapers from a previous overlay.

I don't foresee this change adding significant costs to projects. Milling costs on overlay projects are typically high due to the small quantities required and mobilization would not be affected.

Consequently, use the following criteria to determine taper lengths:

> For overlay thicknesses ≤ 0.35' (100 mm), the taper length = 200' (60 m)
> For overlay thicknesses > 0.35' (100 mm), the taper length is calculated based on 30' (10 m) of taper per 0.05' (15 mm) of plant mix thickness

With the exception of the connections at project ends, provide 30' (10 m) of full depth milling in addition to the taper length. Refer to Section 5.4.4.6 of the Road Design Manual for more information.

A detail of the taper is attached. This change is effective for any plans submitted to the checkers after December 5, 2005

If you have questions please contact me at 444-6244.

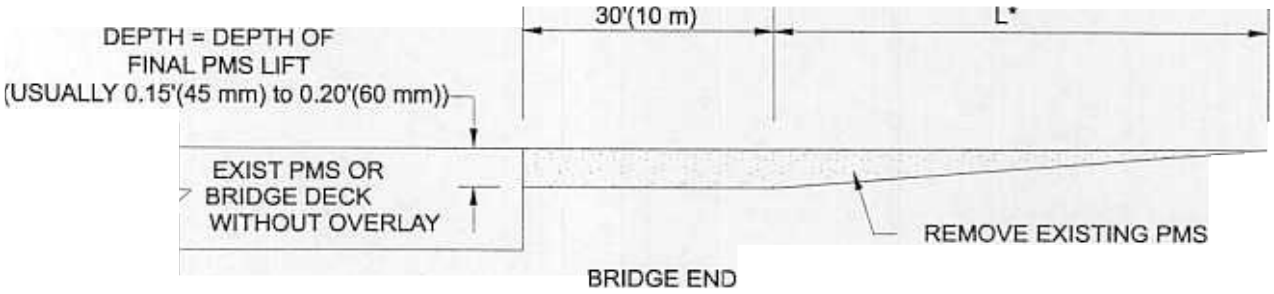
Pf.

Attachment

copies:

Paul Ferry,	Highways Engineer	w/attach
Lesly Tribelhorn	Highways Design Engineer	"
Damian Krings,	Road Design Engineer	"
Duane Williams,	Traffic Engineer	
Tom Martin,	Consultant Design Engineer	
Mark Wissinger,	Construction Engineer	
Matt Strizich,	Materials Engineer	
Kevin Farry,	Road Plans Checker	
John Cornell,	Road Plans Checker	
Gary Neville,	District Engineering Services Supervisor – Billings	
Joe Olsen,	District Engineering Services Supervisor – Butte	
Duane Kailey,	District Engineering Services Supervisor – Missoula	
Steve Prinzing,	District Engineering Services Supervisor – Great Falls	
Jim Frank,	District Engineering Services Supervisor – Glendive	

Cold milling is used in conjunction with overlays to match the new surfacing elevations at bridge decks, cattle guards and connections to existing pavement as shown in the figure below.



** Where the overlay thickness is ≤ 0.35' (100 mm), L = 200' (60 m), Where L is >0.35' (100 mm), calculate L based on 30'(10 m) of taper per 0.05'(15 mm) of plant mix thickness. The 30' (10 m) of full-depth milling is not used for the connections at project ends.*

Example: For a 0.50' (150 mm) overlay, $L = \frac{(0.50)\,(30)}{0.05} = 300'$